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# FLOOD HAZARD ANALYSES

## POCASSET RIVER AND MESHANTICUT BROOK

### CRANSTON, RHODE ISLAND



Depth of expected flooding for 50-year  
storm frequency.

Prepared for  
CITY OF CRANSTON  
In Cooperation With  
RHODE ISLAND DEPARTMENT OF ADMINISTRATION  
STATEWIDE PLANNING PROGRAM  
By the  
UNITED STATES DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
Assisting the  
NORTHERN RHODE ISLAND CONSERVATION DISTRICT



September 1973

AD-33 Bookplate  
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## T A B L E   O F   C O N T E N T S

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## FOREWORD

This report identifies and delineates flood hazard areas along the Pocasset River and Meshanticut Brook in Cranston, Rhode Island. It is intended for use by governmental planning and legislative groups in formulating land use policy, adopting and enforcing land use regulations and providing public information.

The report was prepared by the Soil Conservation Service, U. S. Department of Agriculture, West Warwick, Rhode Island, in cooperation with the Rhode Island Department of Administration, Statewide Planning Program and the city of Cranston under the authority of Section 6, PL 83-566, in accordance with Recommendation 9 (c) of House Document No. 465, 89th Congress and Executive Order 11296.

The data herein provides estimates of flood water elevations and areas inundated under present flood plain use for the 10-, 50-, 100- and 500-year frequency floods.

Appreciation is expressed for the assistance of local agencies and to property owners who cooperated with the survey work connected with the study.





FLOOD HAZARD ANALYSES  
POCASSET RIVER AND MESHANTICUT BROOK  
Cranston, Rhode Island

JUL 1974  
1974

### Introduction

This report contains flood maps, high water profiles, and typical valley cross-sections which indicate the extent of flooding expected to occur along the Pocasset River and Meshanticut Brook. The 50-year flood is shown to meet state law requirements and the 500-year flood is shown as a projection. The 100-year flood is not shown on the flood maps because the area flooded is essentially the same as for the 50-year flood; the depth of flooding will be greater, however, and is shown on the profiles. These floods have an average occurrence of being equalled or exceeded once in the number of years indicated, e.g., the 50-year flood is equalled or exceeded once every 50 years on the average, and has a 2 percent chance of being equalled or exceeded in any given year.

Maps and profiles included in this report present an estimate of the flood hazard and provide an initial step in development of a comprehensive flood plain management program. These delineations can serve as a basis for land use and development control as a principal means of limiting flood losses.

Emphasis has recently been placed on the use of non-structural methods of flood plain management, such as zoning, flood proofing and flood warning. Although structural measures such as flood control dams are required under certain conditions, control of flood plain development would appear to be an effective method of minimizing flood losses in the study area.

Recommendations concerning legal aspects and methods of implementing a flood plain management program are not within the scope of this report.

Various information brochures on flood plain management have been published by the U. S. Army Corps of Engineers. Information and technical assistance is available through Rhode Island Department of Administration, Statewide Planning Program; soil and water resources information useful for planning can be provided by the Soil Conservation Service. "Regulation of Flood Hazard Areas to Reduce Flood Losses" published by Water Resources Council and available through Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402, provides comprehensive coverage of the subject.

Rhode Island Department of Administration, Statewide Planning Program, and the Soil Conservation Service, U. S. Department of Agriculture, will provide technical assistance in interpretation and uses of information developed in this study.

Requests may be addressed to:

U. S. Department of Agriculture  
Soil Conservation Service  
222 Quaker Lane  
West Warwick, Rhode Island 02893

or

Rhode Island Department of Administration  
Statewide Planning Program  
265 Melrose Street  
Providence, Rhode Island 02907

### Description of Watershed

The Pocasset River and Meshanticut Brook are major streams that flow through the city of Cranston.

The Pocasset River originates near the northern boundary of the town of Johnston. It flows in a southeasterly direction and is joined by Dry Brook and then by Simmons Brook. It drains an area of 21.3 square miles when it empties into the Pawtuxet River downstream of Sockanosset.

Two-thirds of the Pocasset River drainage is in woodland, with a scattering of swamps and ponds throughout the watershed. The lower third of this watershed is extensively urbanized, interspersed with industrial and commercial development.

The Meshanticut Brook is located almost entirely within the city of Cranston. It has a drainage area of 13 square miles at its confluence with the Pawtuxet River at West Warwick. Furnace Hill Brook is the major tributary in this watershed. It commences just over the city line in the town of Johnston and drains an area of 5.6 square miles.

The upper two-thirds of Meshanticut Brook Watershed consists of low, rolling hills, open farm land primarily in grass cover, and some swampy areas. Most development in the watershed is concentrated along Oaklawn Avenue.

These streams have a history of flooding rather frequently with varying amounts of damages. The flood of record is the 1968 storm; total dollar amounts of damages for this storm have not been stated separately for the flood plains of these streams.

## Procedures and Techniques

Flood runoff volumes and flows were developed on the basis of stream hydraulics, soil cover, land use and rainfall data. Cross-section surveys of the stream channel and valley were used to determine water surface profiles for various flows; flood hydrographs for 10-, 50-, 100- and 500-year floods were then developed and routed through the watershed using computer programs prepared for this purpose. The resulting computer printout of water levels at surveyed sections for each of the four floods was used to prepare flood profiles and plan views of flooded areas shown herein.

Topographic data was obtained from U. S. Geological Survey topographic maps. These maps, together with cross-section survey data and field checks, were used to delineate the approximate extent of flooding on the included aerial photograph enlargements. Enlargements were made from 1970 aerial photography 1" = 1000'.

Engineering survey data and computations were organized to allow future reference and use as needed, and are on file with Rhode Island Department of Administration, Statewide Planning Program.

## Flood Delineations

Study results are in the form of an aerial photo of the flood plain, and flood water profiles. Due to variations in relief, the edges of flood hazard areas outlined on aerial photos are approximate. In order to accurately determine the flood hazard at a point near the edge of the flood plain, the user can locate the point on the map and read the expected flood water elevation from the corresponding location on the profile. Safety of the location can then be determined by inspection or, if necessary, by surveying its mean sea level elevation.

Flood water profiles are plotted for 10-, 50-, 100- and 500-year frequency floods. Elevations shown by the profiles could be used to establish monuments at flood area boundaries, if desired by the city of Cranston.

Normal bridge flow conditions were assumed. No consideration was made for openings blocked by ice or other debris. Also, only those features in the flood plain at the time field surveys were made were considered in computations. Flood plain modifications will change elevations of profiles shown and revised water surface profiles will be required.

## Use of the Report

Potential users of flood plains should base their decisions upon advantages and disadvantages of such a location. Knowledge of flood plain hazards is not widespread. Consequently managers, potential users

and occupants cannot always accurately assess risks. In order for flood plain management to effectively play its role in future development of flood plains, it is necessary to:

1. Provide appropriate technical information to state and local units of government.
2. Provide technical services to managers of flood plain property for community, industrial and agricultural uses.
3. Improve basic technical knowledge about flood plain hazards in cooperation with other agencies and groups.

This report does not contain recommendations for solutions of local flood problems. It is intended to provide a technical basis for arriving at solutions to minimize flood damages. Such solutions could include the following non-structural means:

1. Land use planning
2. Flood plain control regulations
3. Flood plain development regulations
4. Flood plain filling regulations
5. Flood plain zoning
6. Flood plain acquisition
7. Upstream land treatment program
8. Flood warning system
9. Flood insurance

Structural measures which would complement the above include:

1. Flood water retarding structures
2. Channel improvement
3. Levees
4. Pumps
5. Flood proofing

# **APPENDIX**

## **PROFILES AND FLOOD DELINEATION MAPS**

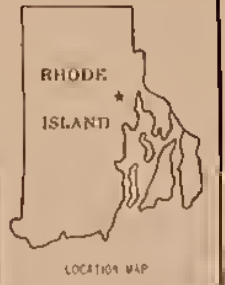












# LEGEND

- Stream channel
- Sheet coverage

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

## FLOOD HAZARD STUDY AREA AND STRIP MAP INDEX

POCASSET RIVER AND MESHANTICUT BROOK  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND

Scale 1:22,700













LEGEND

-  Stream channel
-  500-year flood area
-  50-year flood area
-  544+30 Valley section

MATCH LINE SHEET 3

489+00

BUDLONG ROAD

RESERVOIR AVENUE

520+69

532+19

528+33

525+19

MATCH LINE SHEET 1

N

SCALE 1:4800

400 0 400 800 1200 FEET

SOURCE: Semi-Controlled Mosaic prepared from USDA-ASCS  
Aerial photography flown April 1970

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
FLOOD HAZARD AREA-POCASSET RIVER  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND  
SEPTEMBER 1973  
SHEET 2

USDA SCS-WATERVILLE, MD. 1973





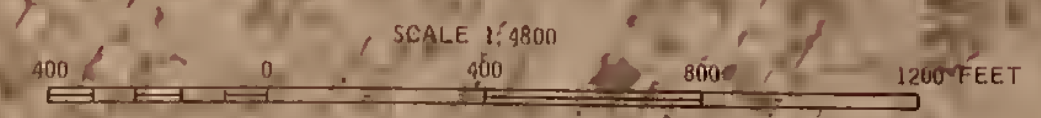




LEGEND

- Stream channel
- 500-year flood area
- 50-year flood area
- 544+30 Valley section

SOURCE Semi- Controlled Mosaic prepared from USDA-ASCS  
Aerial photography flown April 1970



U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

FLOOD HAZARD AREA-POCASSET RIVER  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND

SEPTEMBER 1973 SHEET 3









LEGEND

- Stream channel
- 500-year flood area
- 50-year flood area
- 544 + 30 Valley section

SCALE 1:4800

400 0 400 800 1200 FEET

N

FARMINGTON AVENUE

398 + 80  
399 + 25  
399 + 98

OXFORD STREET

DYER AVENUE

PLAINFIELD PIKE

END OF STUDY AREA

319 + 04

347 + 25

MATCH LINE SHEET 3

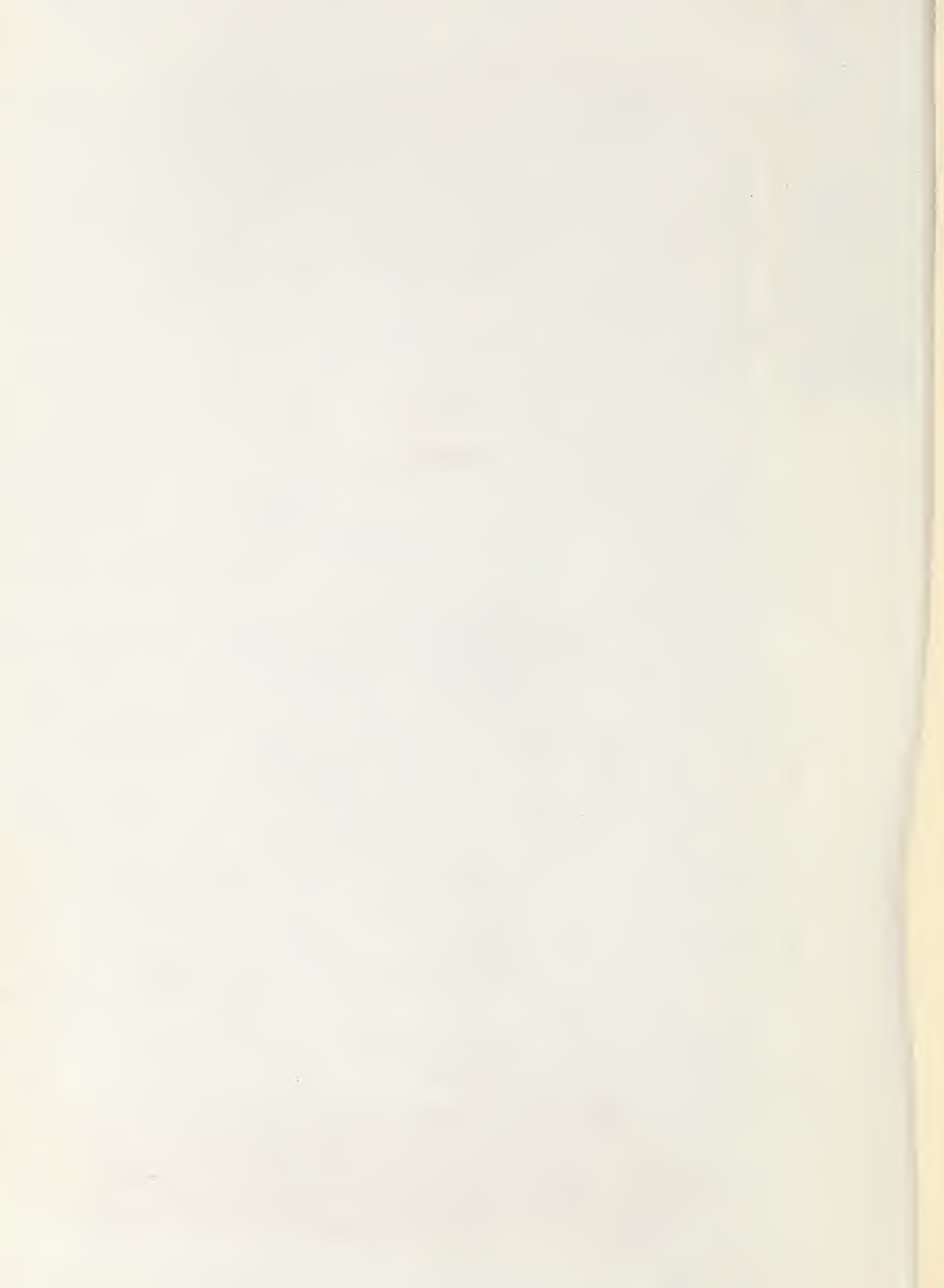
MATCH LINE SHEET 5

SOURCE Semi-Controlled Map prepared from USDA-ASCS  
Aerial photography flown April 1970

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
FLOOD HAZARD AREA-POCASSET RIVER  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND  
SEPTEMBER 1973  
SHEET 4

USDA PCS HYATSVILLE, MO. 19-1









MATCH LINE SHEET 4







RANDALL STREET

PHENIX AVENUE

ATWOOD AVENUE

ELENA STREET

LEGEND

-  Stream channel
-  500-year flood area
-  50-year flood area
-  544 + 30 Valley section

SCALE 1:4800



SOURCE Semi-Controlled Mosaic prepared from USDA-ASCS  
Aerial photography flown April 1970

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE

FLOOD HAZARD AREA-POCASSET RIVER  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND

SEPTEMBER 1973

SHEET 5

USDA-SCS, HARTISVILLE, MD. 21730







# LEGEND

- Stream channel
- 500-year flood area
- 50-year flood area
- 544 + 30 Valley section

SCALE 1:4800  
400 0 400 800 1200 FEET

INTERSTATE 295

NATICK AVENUE

NEW LONDON AVENUE

NEW YORK NEW HAVEN & HARTFORD RR

NEW LONDON AVENUE

OAK LAWN AVENUE

MAYFIELD AVENUE

PROVIDENCE COUNTY  
KENT COUNTY

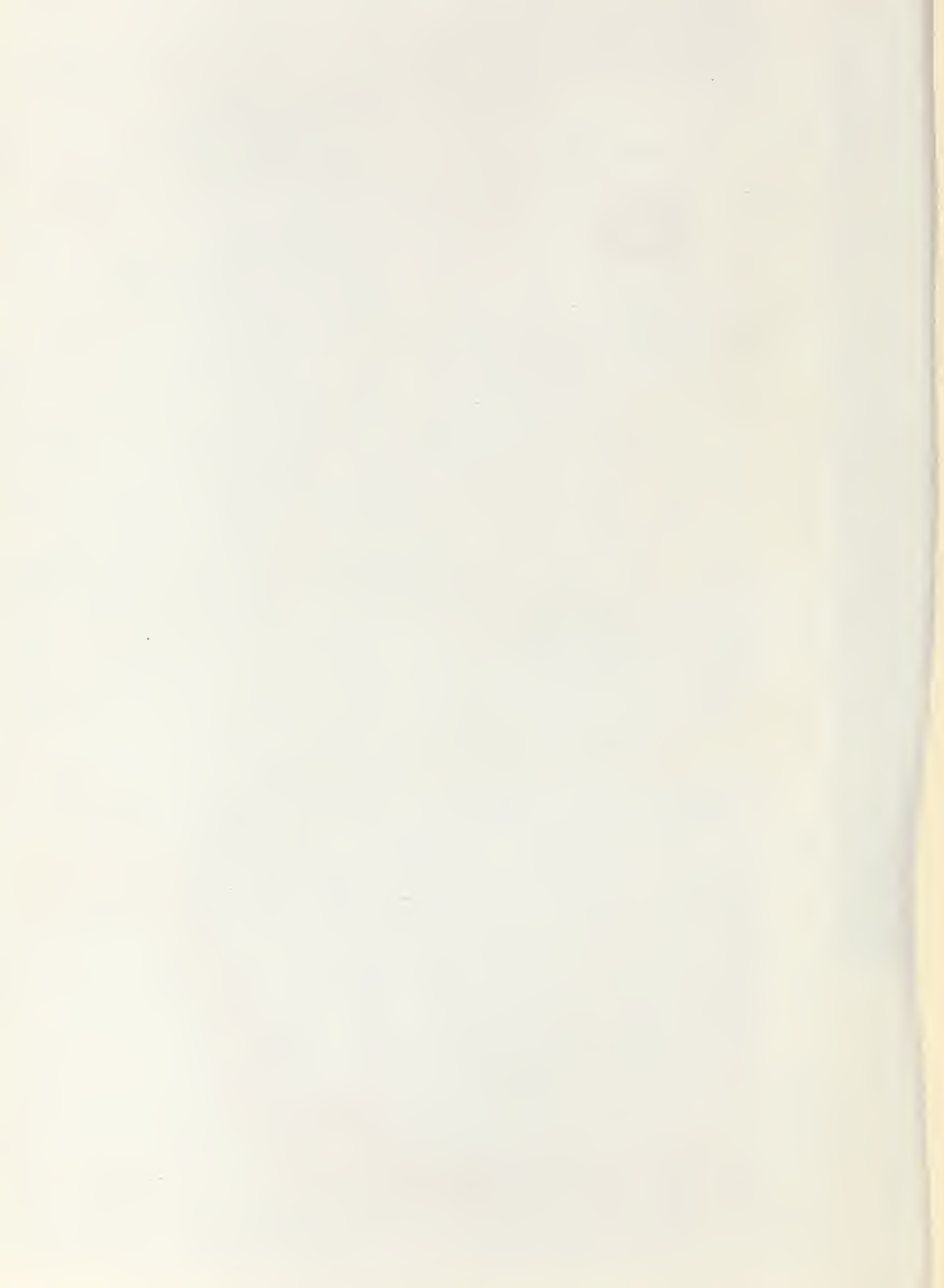
SOURCE: Semi-Controlled Mosaic prepared from USDA-ASCS  
Aerial photography flown April 1970

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SOIL CONSERVATION SERVICE  
FLOOD HAZARD AREA  
MESHANTICUT BROOK  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND  
SEPTEMBER 1973 SHEET 6

USDA SC-HYATTSVILLE MD 1973



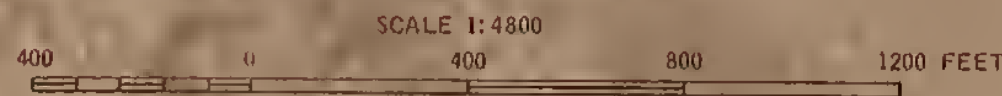




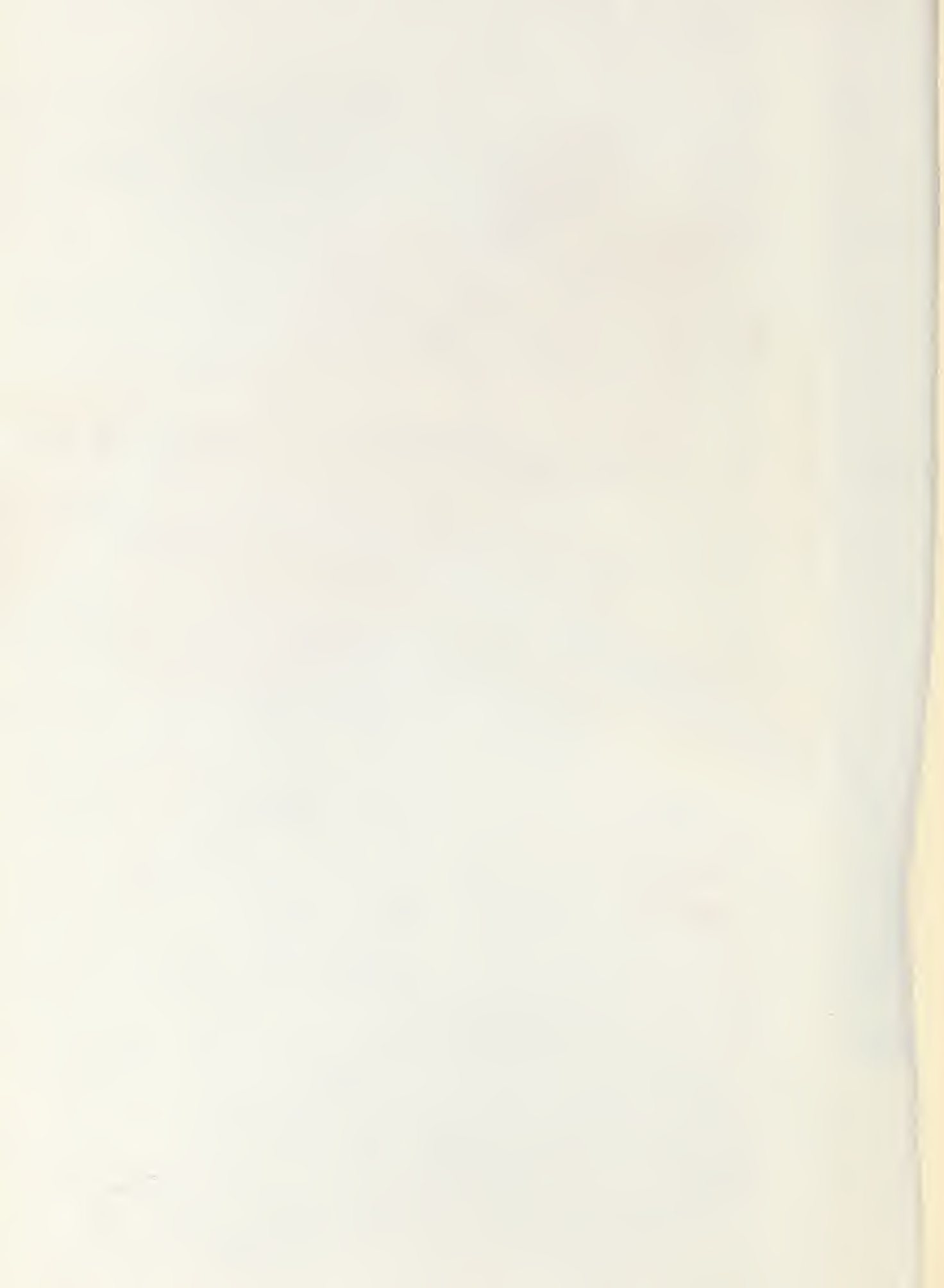


U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE
FLOOD HAZARD AREA MESHANTICUT BROOK TOWN OF CRANSTON PROVIDENCE COUNTY, RHODE ISLAND SEPTEMBER 1973
SHEET 7

SOURCE: Semi-Controlled Mosaic prepared from USDA - ASCS  
Aerial photography flown April 1970












LEGEND

-  Stream channel
-  500-year flood area
-  50-year flood area
- 544+30 Valley section



OAK LAWN AVENUE

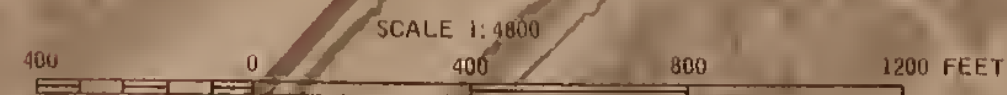
NEW YORK NEW HAVEN & HARTFORD RR

CRANSTON STREET

MATCH LINE SHEET 2

PHENIX AVENUE

END OF STUDY AREA



SOURCE Semi- Controlled Mosaic prepared from USDA-ASCS  
Aerial photography flown April 1970

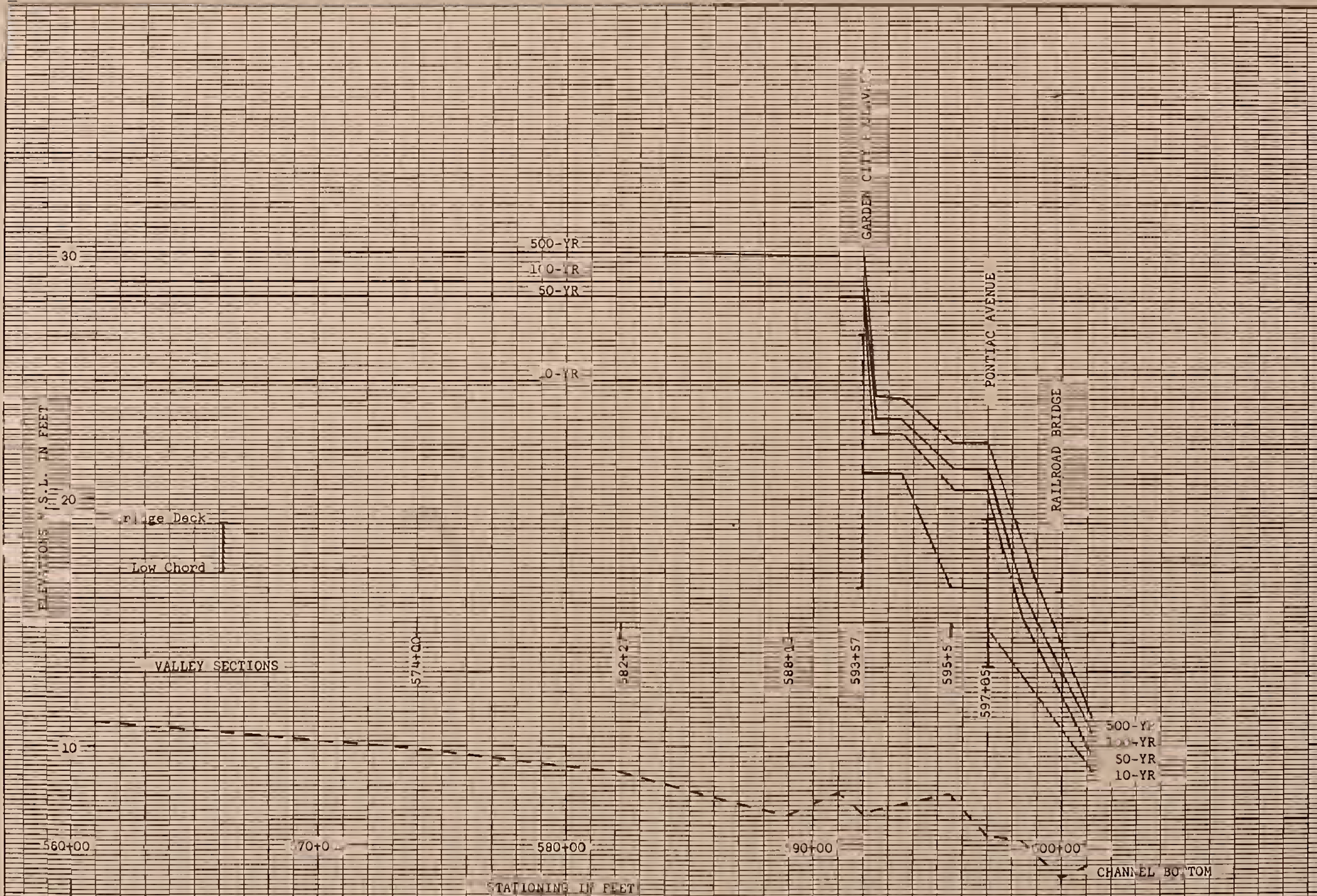
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SOIL CONSERVATION SERVICE  
FLOOD HAZARD AREA  
MESHANTICUT BROOK  
TOWN OF CRANSTON  
PROVIDENCE COUNTY, RHODE ISLAND  
SEPTEMBER 1973  
SHEET 8

USDA SCS HYATTSVILLE MD. 1873









REFERENCE

POCASSET RIVER  
FLOOD PROFILES  
CRANSTON, RHODE ISLAND

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
ASSISTING  
SOIL CONSERVATION DISTRICT

DRAWING NUMBER

SHEET 1 OF 9 SHEETS  
DATE MAY 1973









ELEVATIONS M.S.L. IN FEET

30

20

VALLEY SECTIONS

10

Bridge Deck

Low Chord

520+00

530+00

540+00

550+00

STATIONING IN FEET

RESERVOIR AVENUE

525+69

535+19

530+65

532+19

533+54

544+30

500-YR

100-YR

50-YR

10-YR

TUNNEL BOTTOM

REFERENCE

POCASSET RIVER  
FLOOD PROFILES  
CRANSTON, RHODE ISLAND

U. S. DEPARTMENT OF AGRICULTURE  
SOIL CONSERVATION SERVICE  
ASSISTING  
SOIL CONSERVATION DISTRICT

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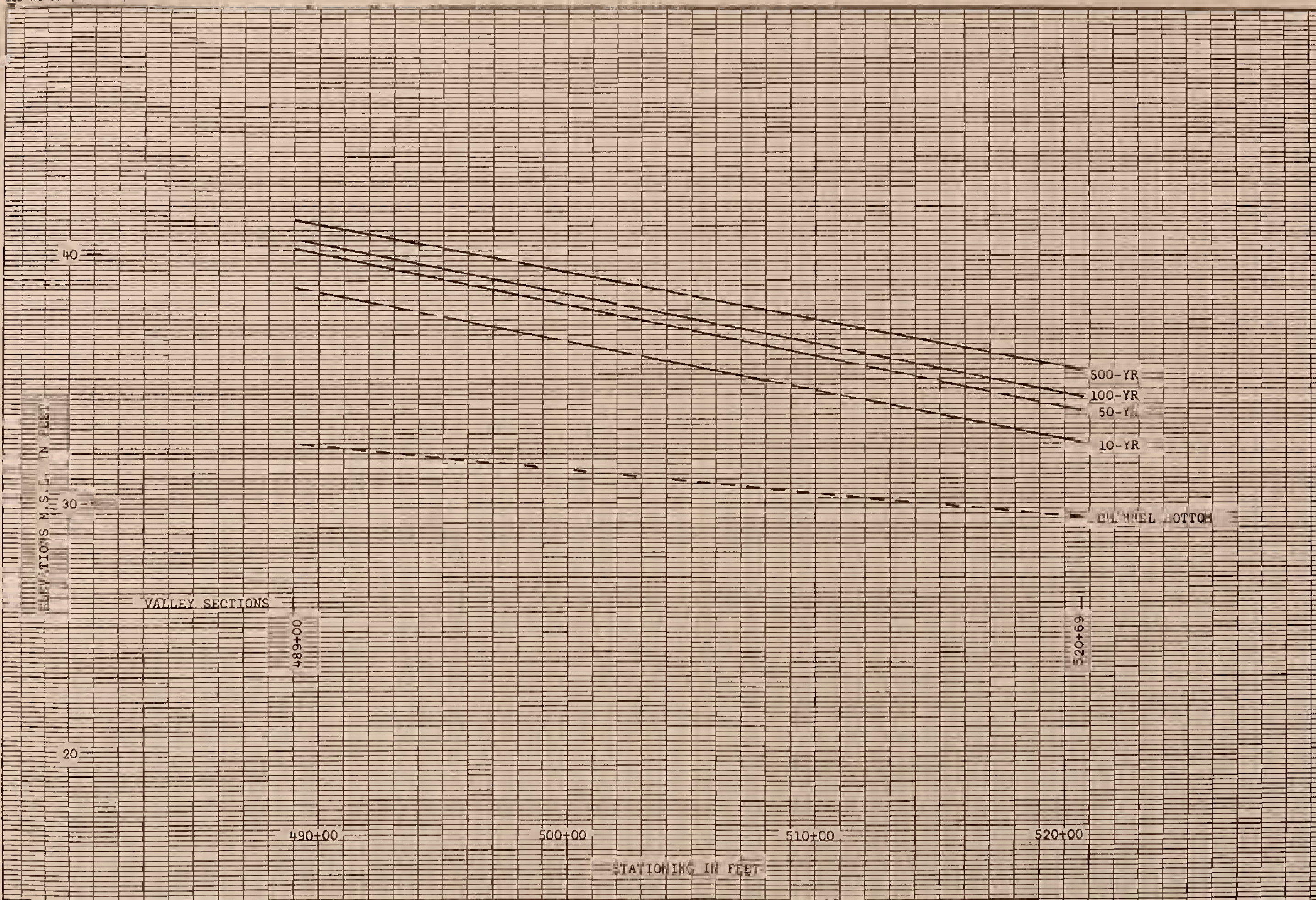
DATE MAY 1973











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FLOOD PROFILES  
CRANSTON, RHODE ISLAND

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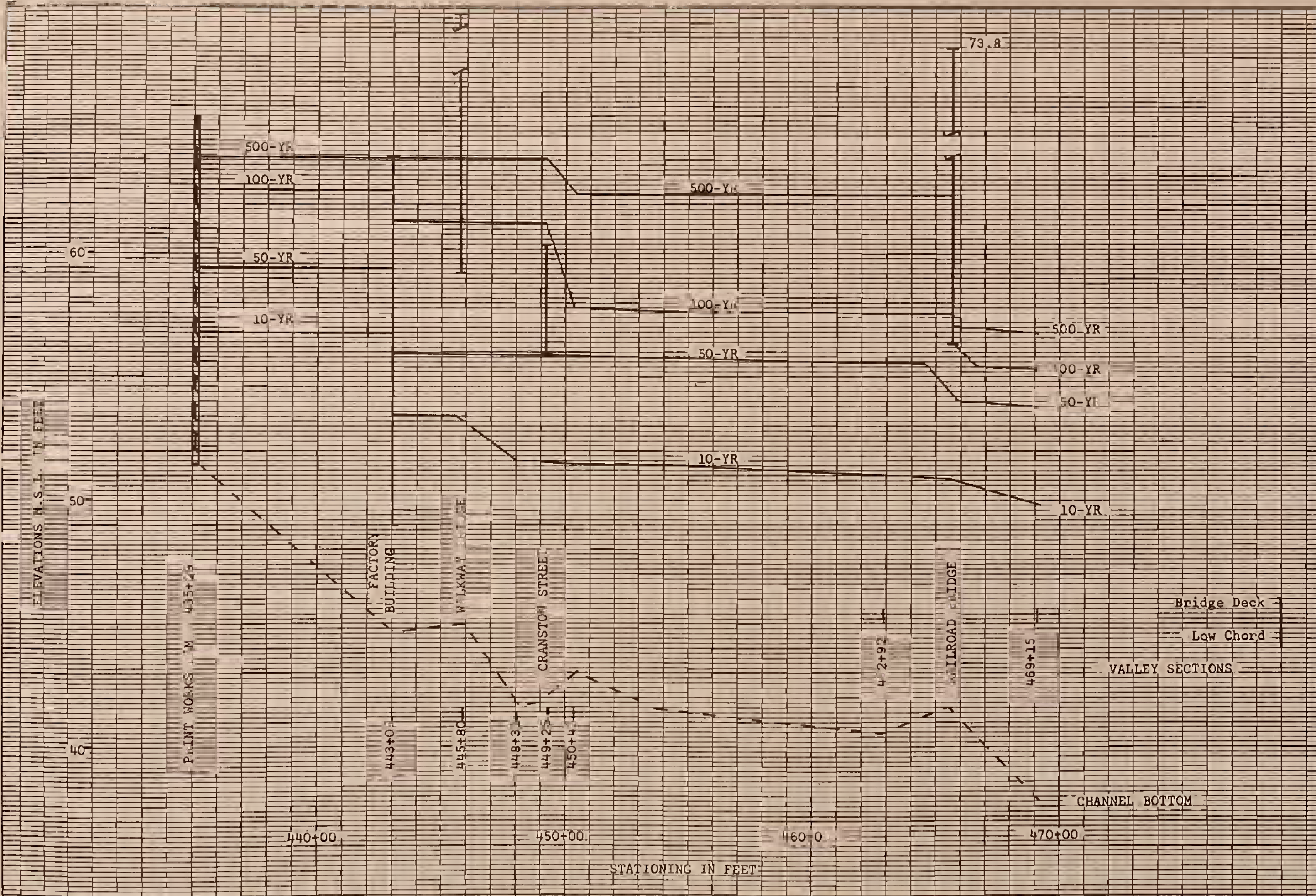
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ELEVATION, F.S.L. IN FEET

70

60

50

VALLEY SECTIONS

398+80  
399+25

DUNEDIN STREET

Bridge Deck

Low Chord

400+00

410+00

420+00

430+00

435+25

PRINTWORK P. ND 1A

00-YR  
100-YR  
50-YR  
10-YR

STATIONING IN FEET

REFERENCE

POCASSET RIVER  
FLOOD PROFILES  
CRANSTON, RHODE ISLANDU. S. DEPARTMENT OF AGRICULTURE  
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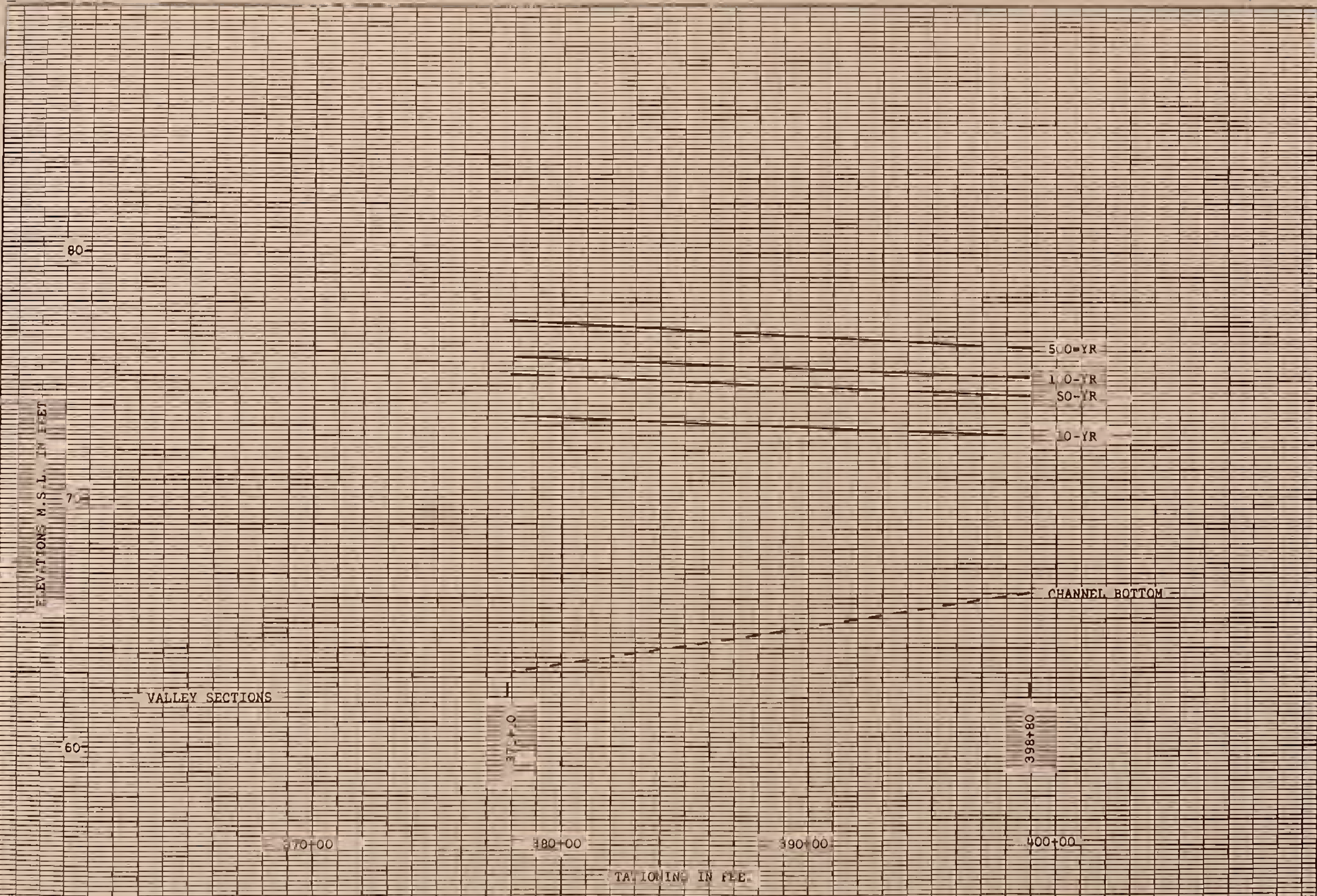
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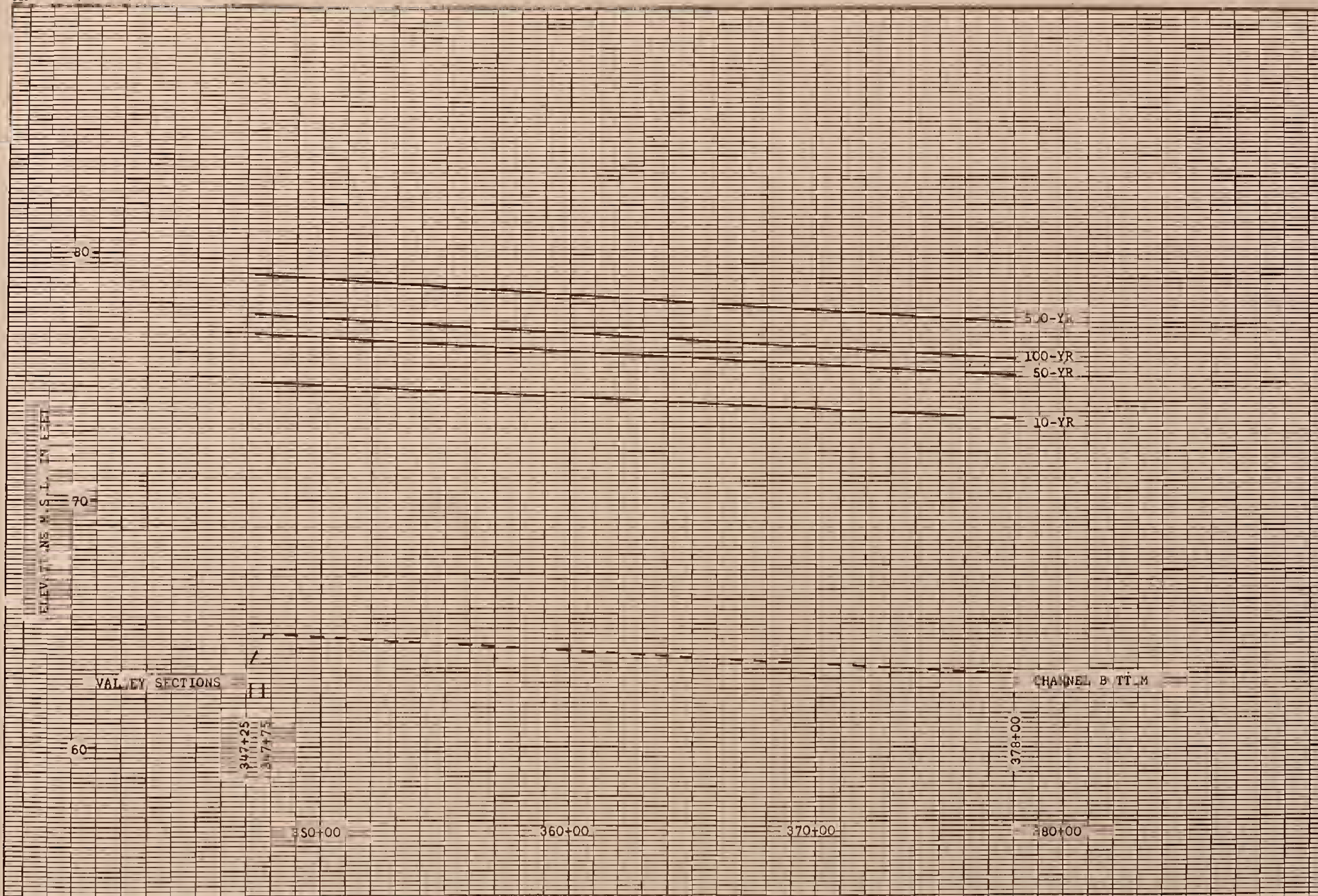












REFERENCE

POCASSET RIVER  
FLOOD PROFILES  
CRANSTON, RHODE ISLAND

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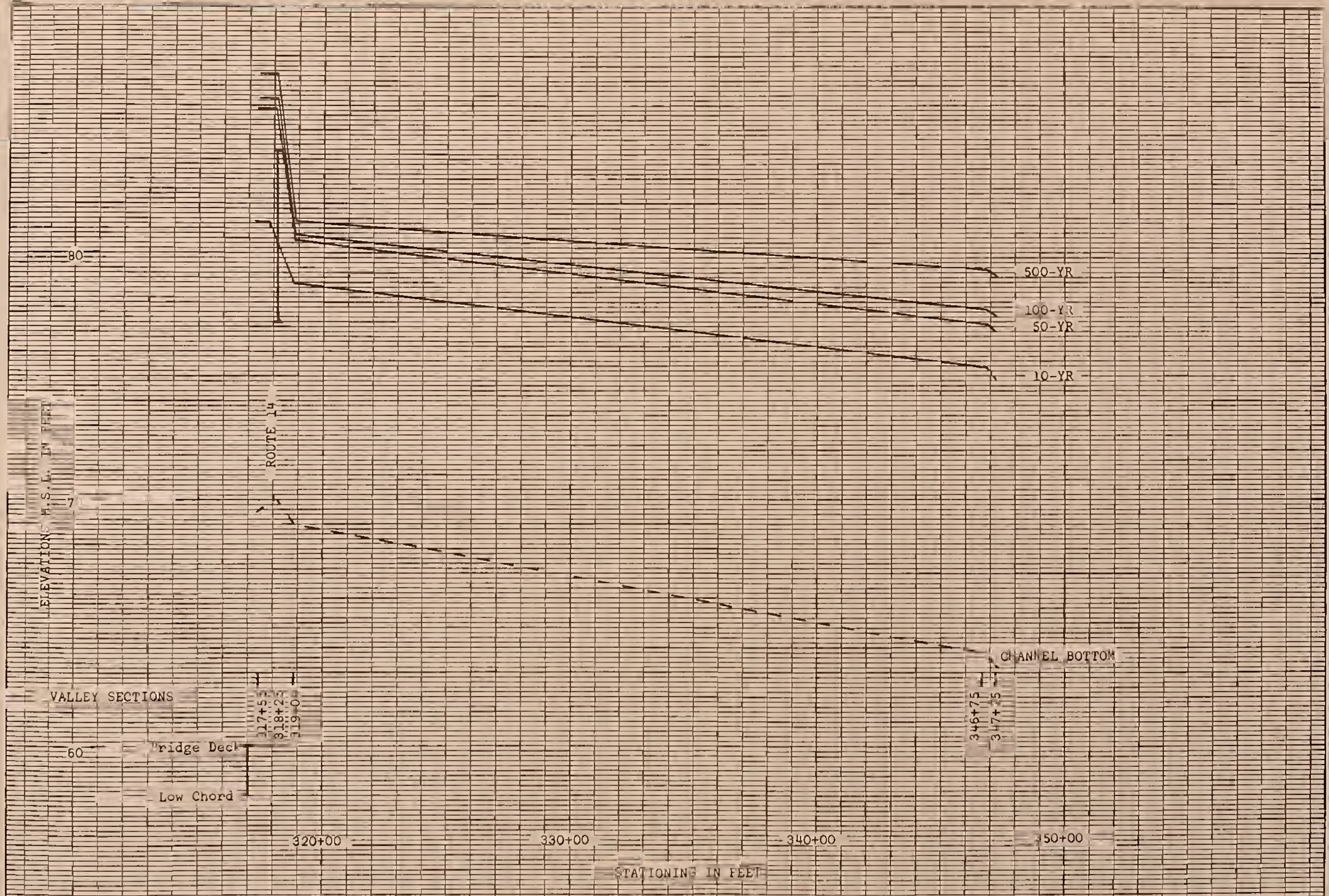
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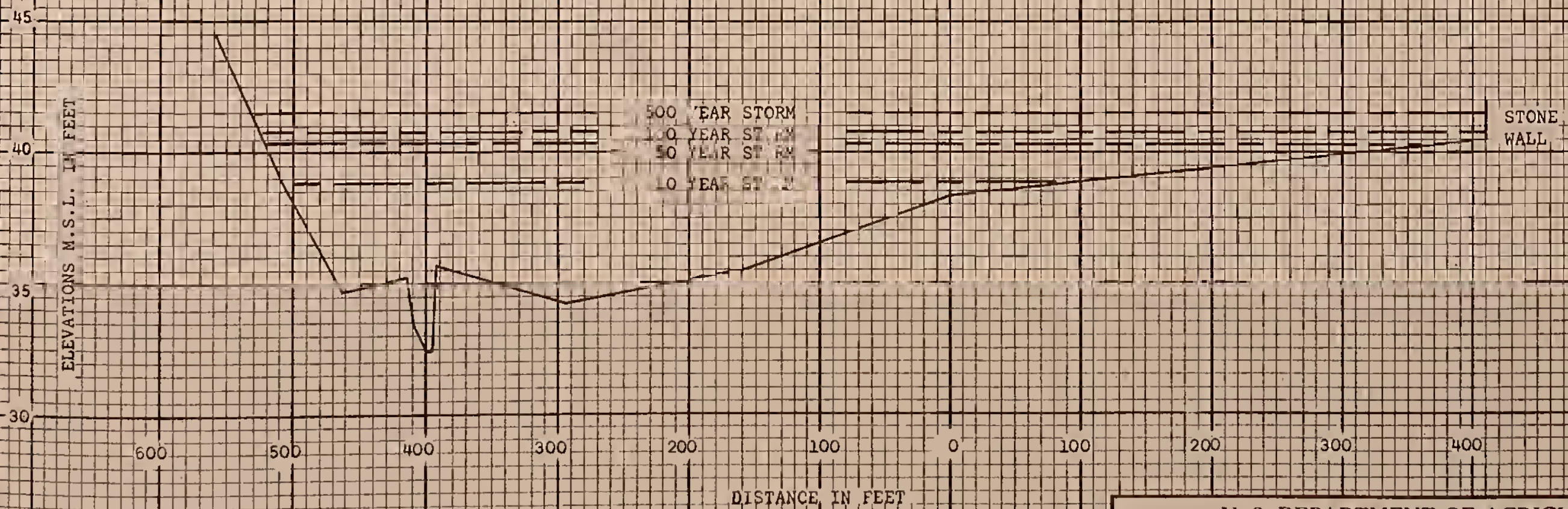




POCASSET RIVER WATERSHED

TYPICAL CROSS SECTION

STATION 489+00



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SOIL CONSERVATION SERVICE

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# POCASSET RIVER WATERSHED

## TYPICAL CROSS SECTION

STATION 574+00

500 YEAR STORM

100 YEAR STORM

10 YEAR STORM

10 YEAR STORM

ELEVATION M.S.L. IN FEET

HOUSE

HOUSE

DISTANCE IN FEET

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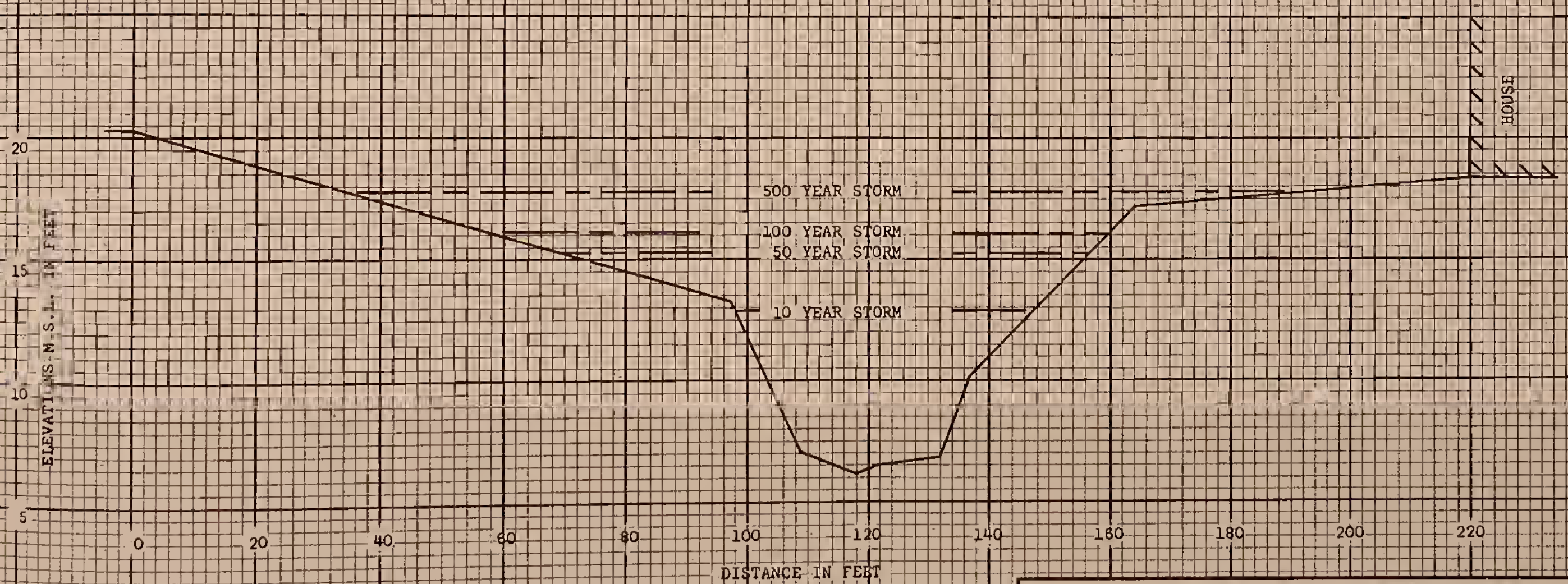




# POCASSET RIVER WATERSHED

## TYPICAL CROSS SECTION

STATION 598+46



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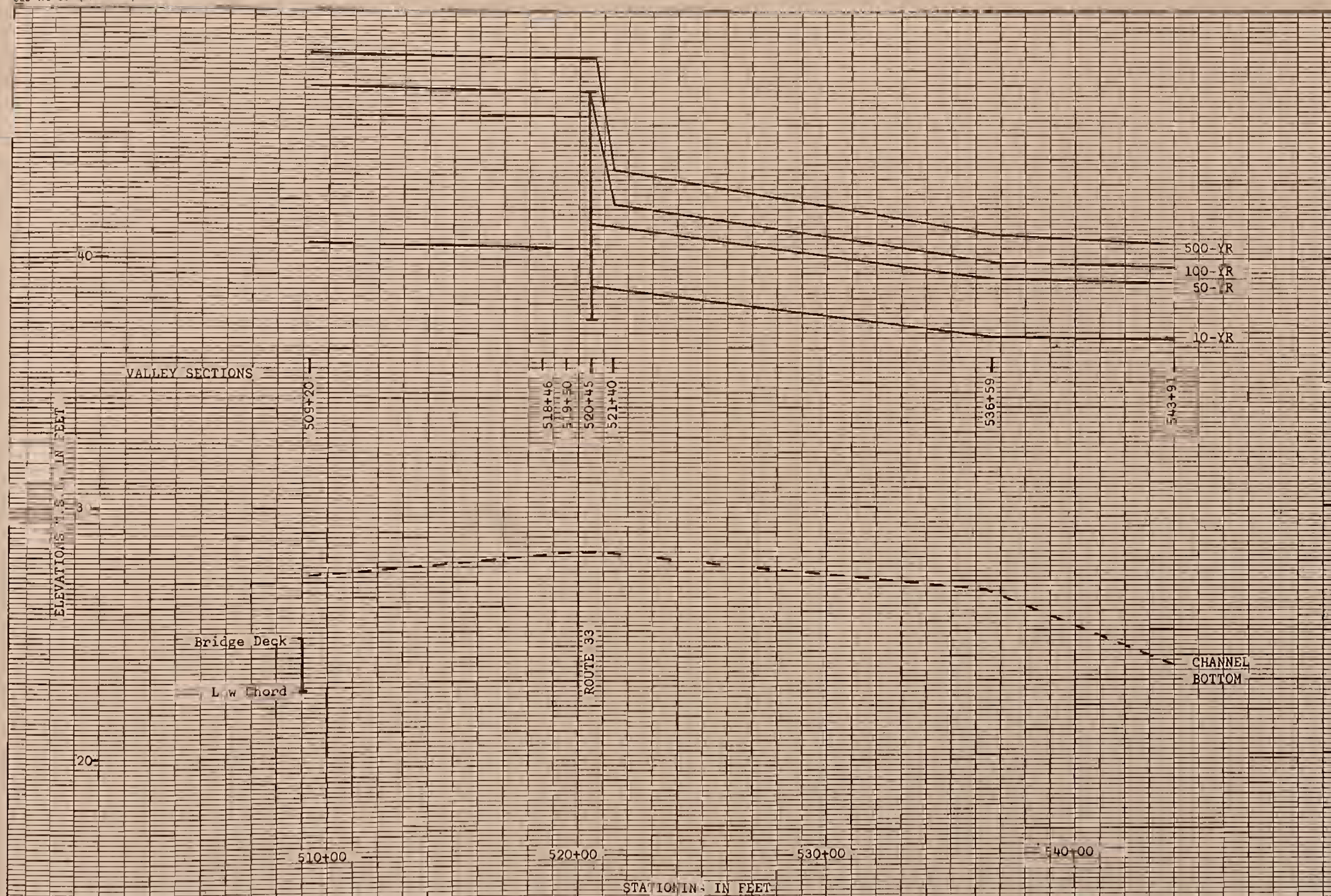












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MESHANTICUT BROOK  
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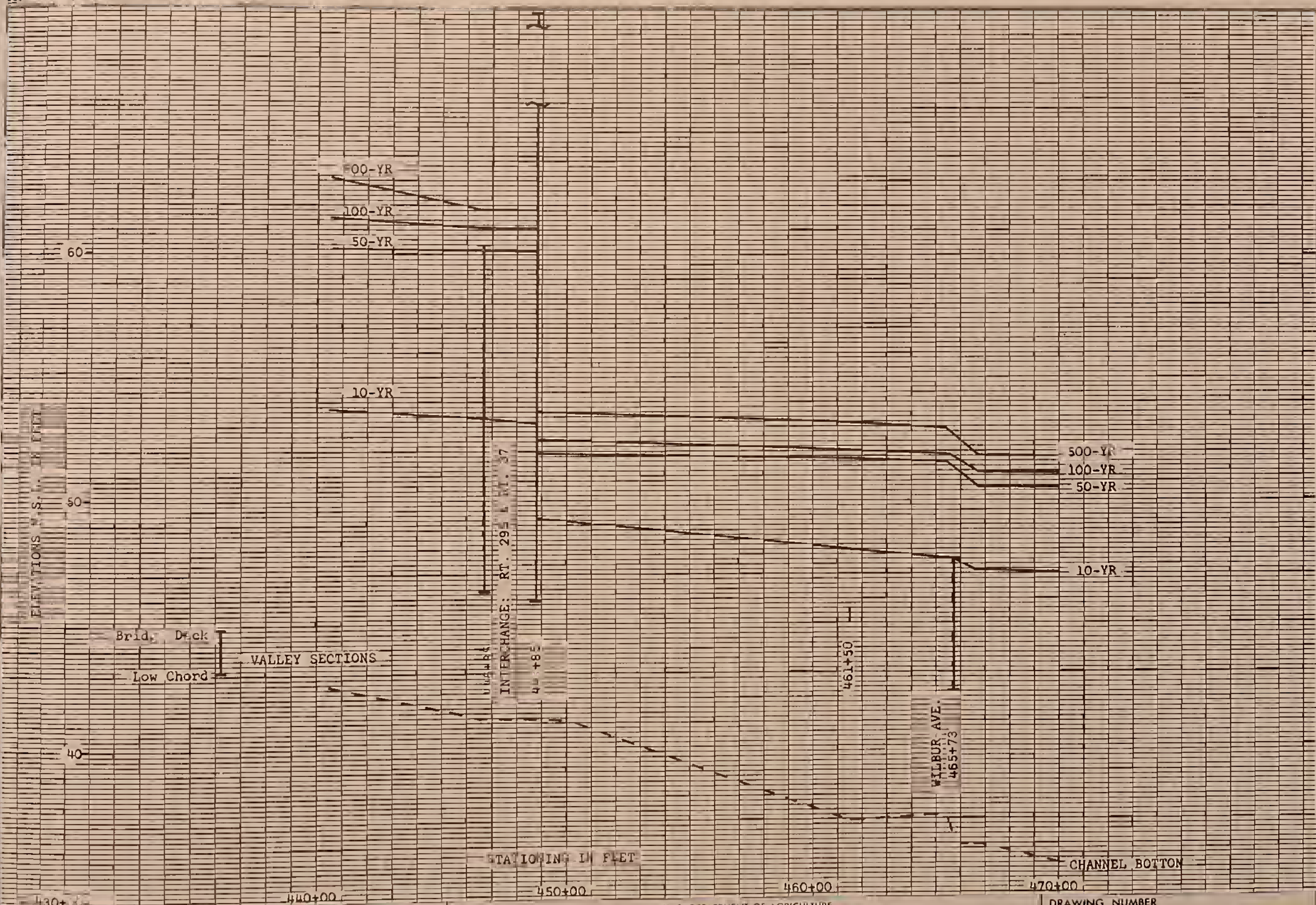












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MESHANTICUT BROOK  
 FLOOD PROFILES  
 CRANSTON, RHODE ISLAND

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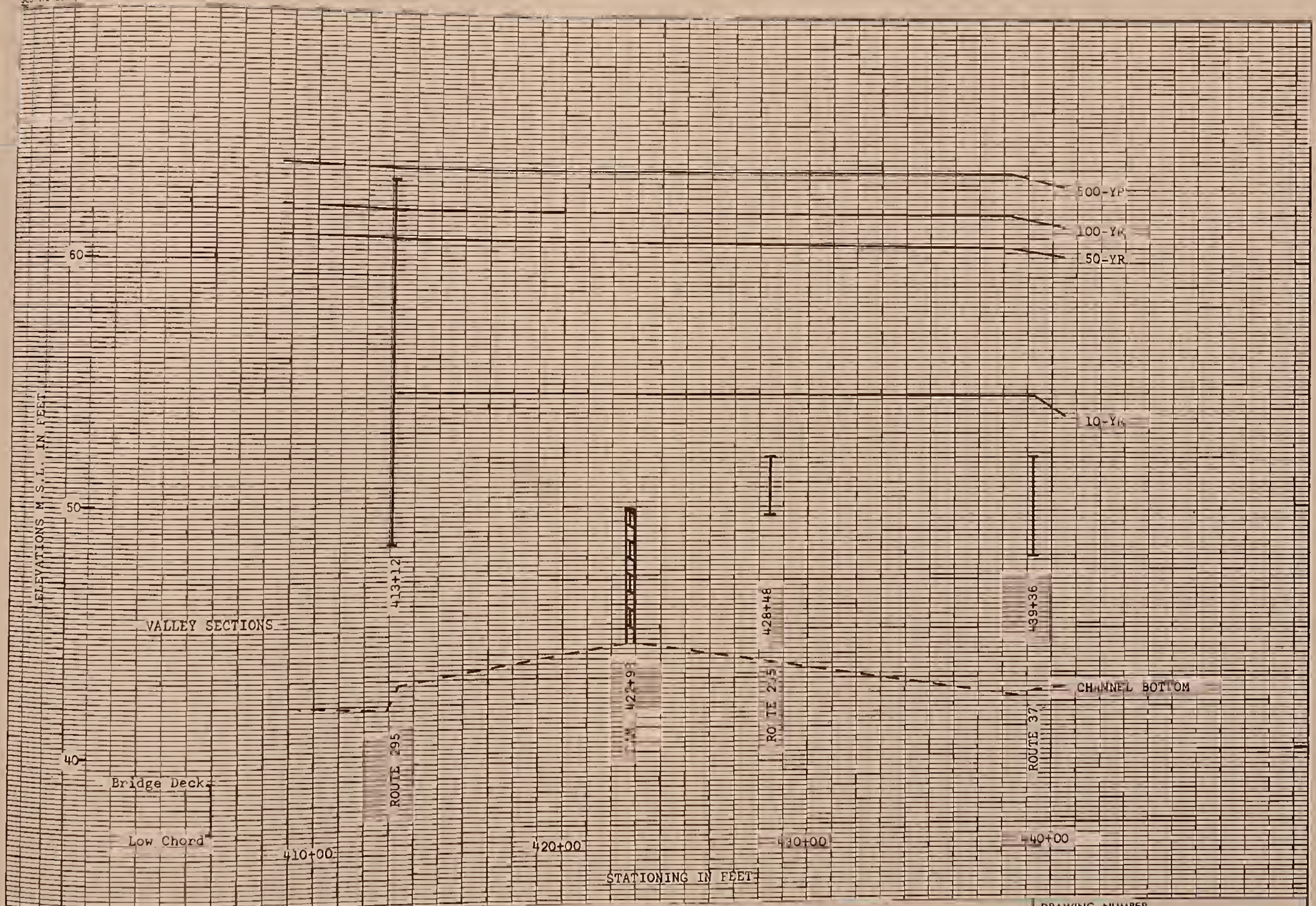












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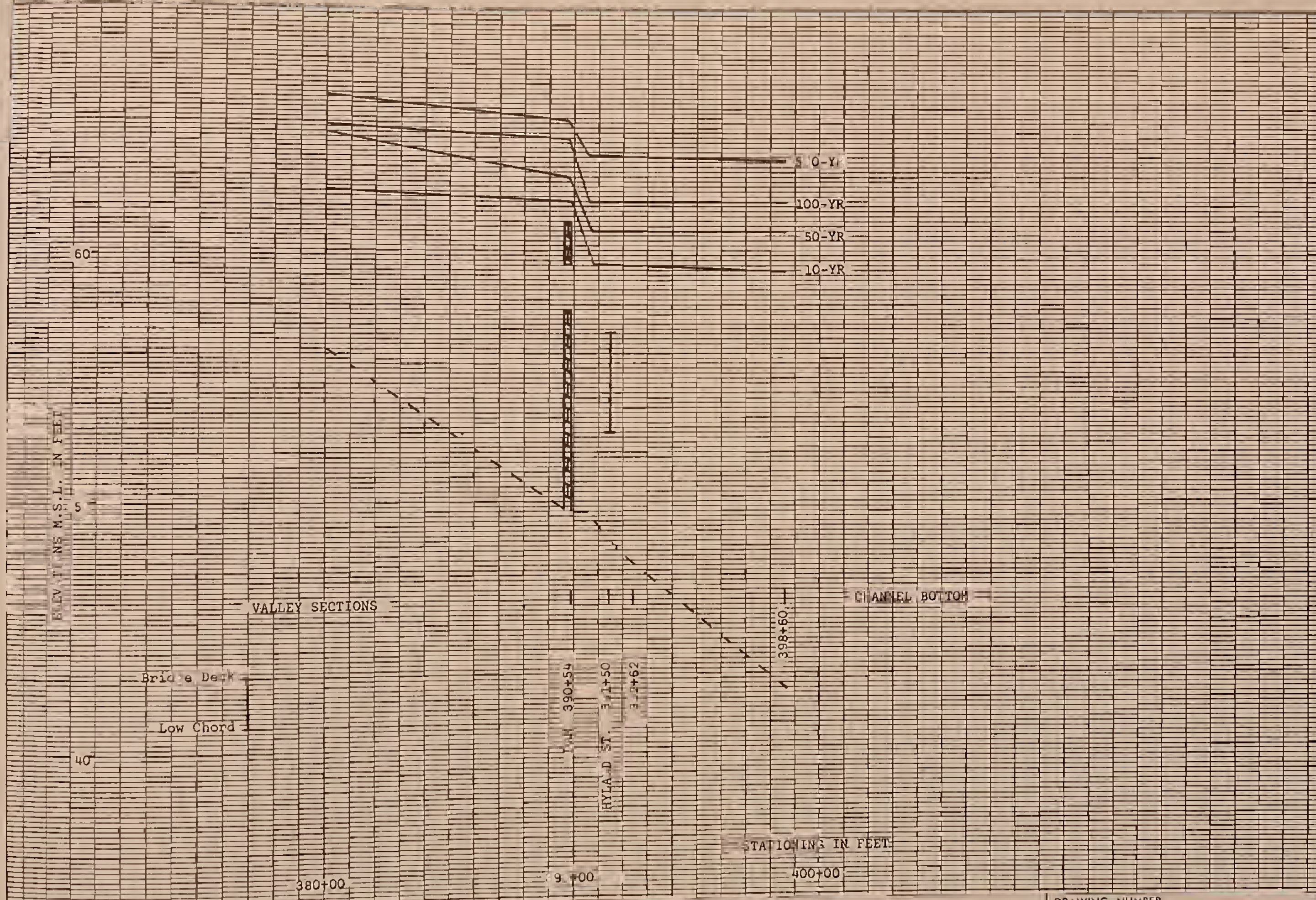












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DATE MAY 1973

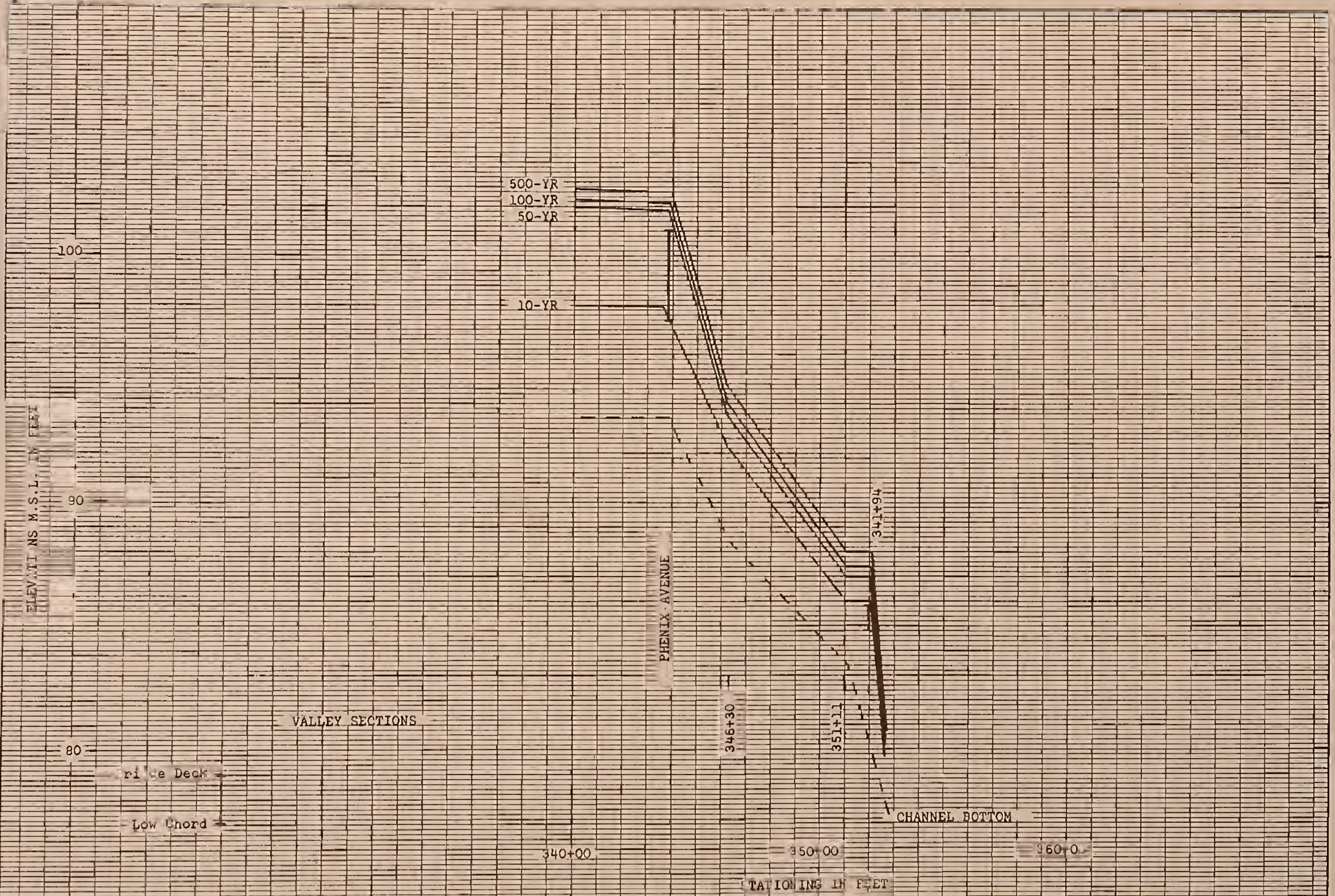












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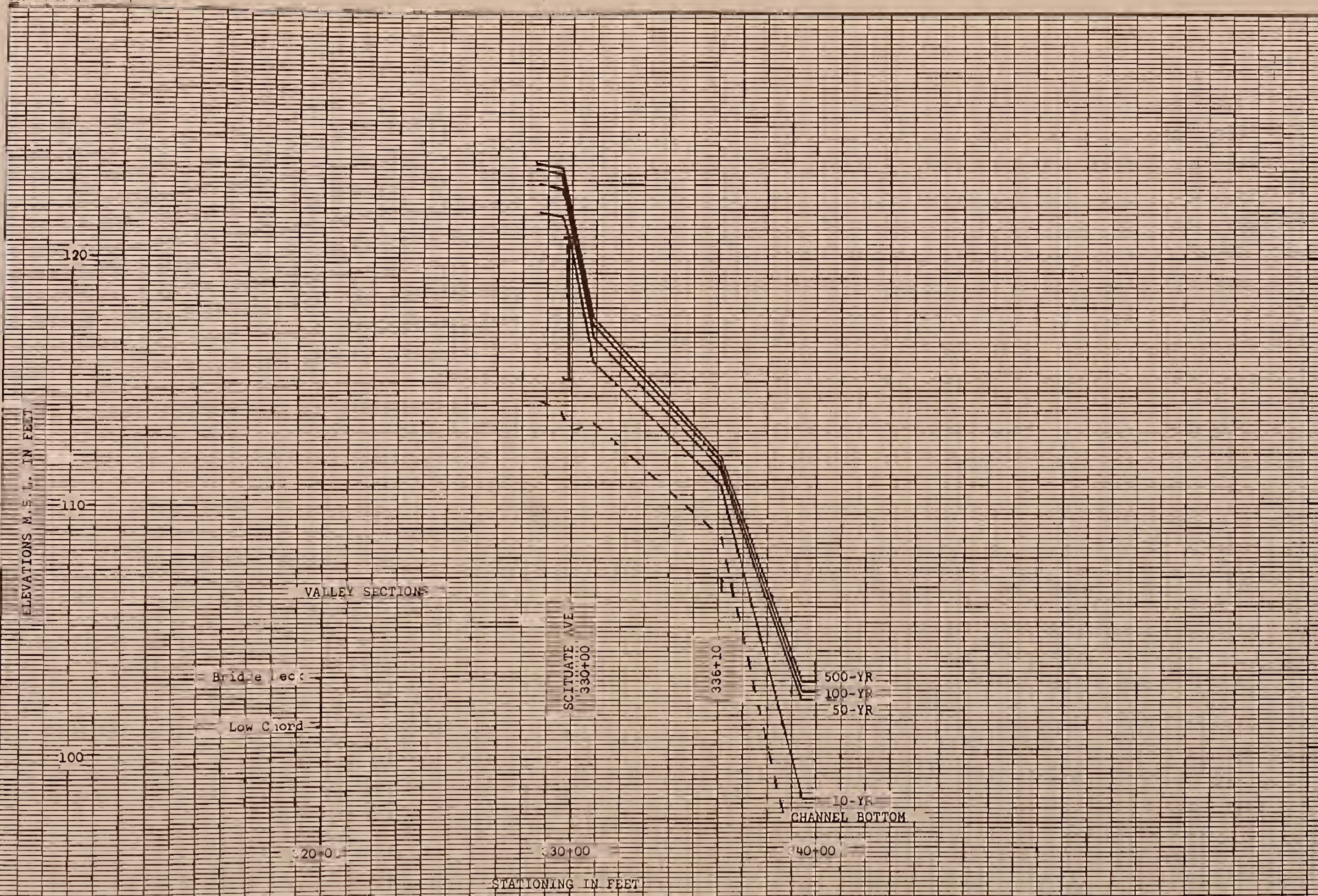












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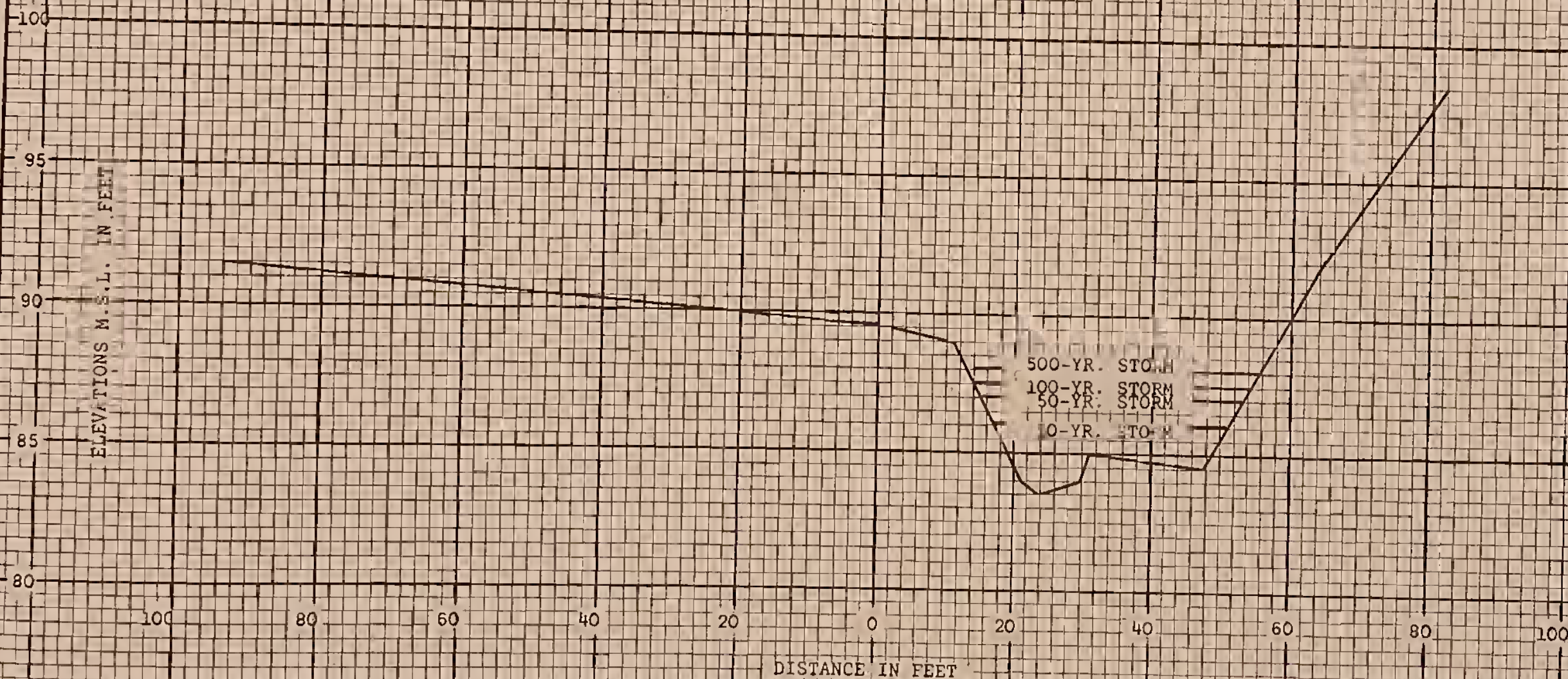








MESHANTICUT BROOK  
TYPICAL CROSS SECTION  
STATION 351+16



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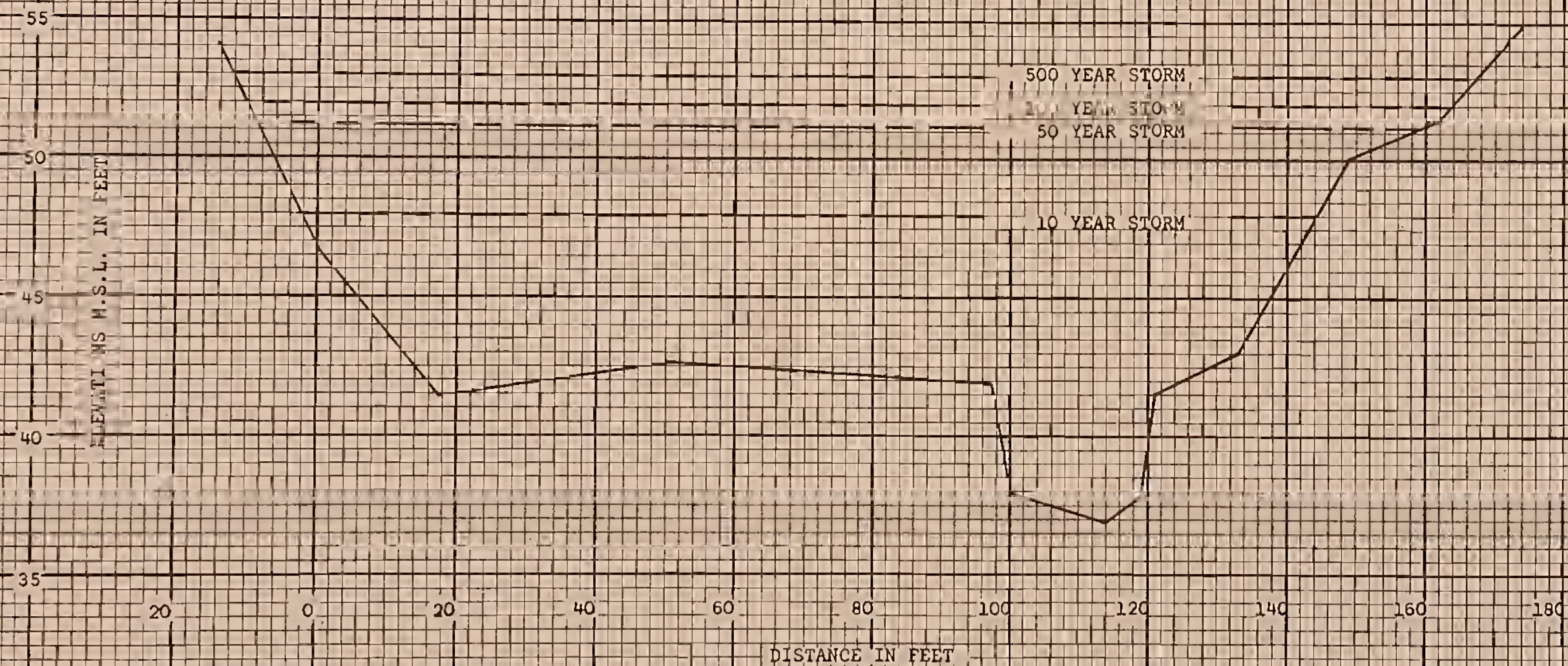








MESHANTICUT BROOK  
TYPICAL CROSS SECTION  
STATION 461+50



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SOIL CONSERVATION SERVICE

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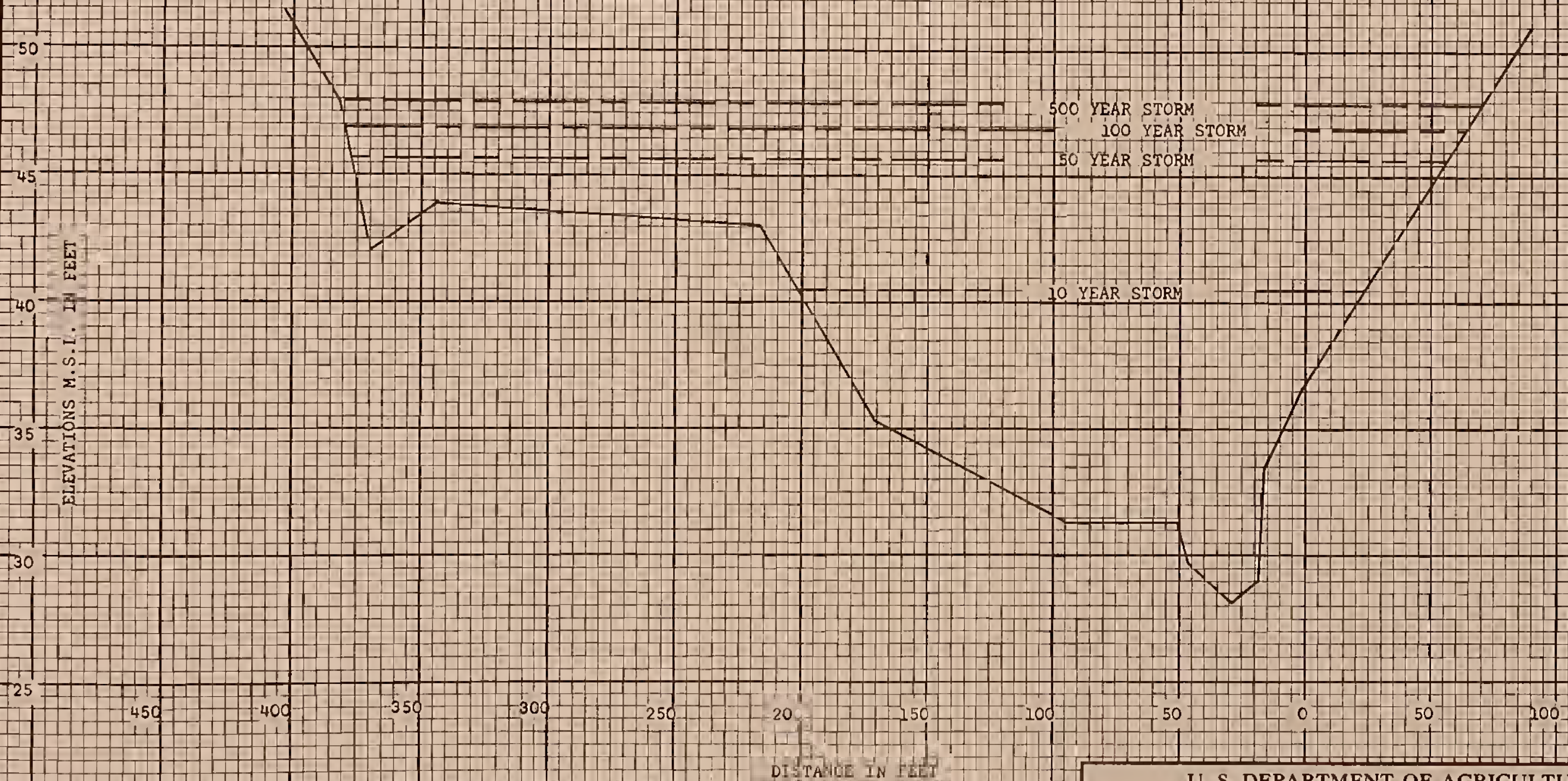








MESHANTICUT BROOK  
TYPICAL CROSS SECTION  
STATION 518+48



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RAM

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OF

3









